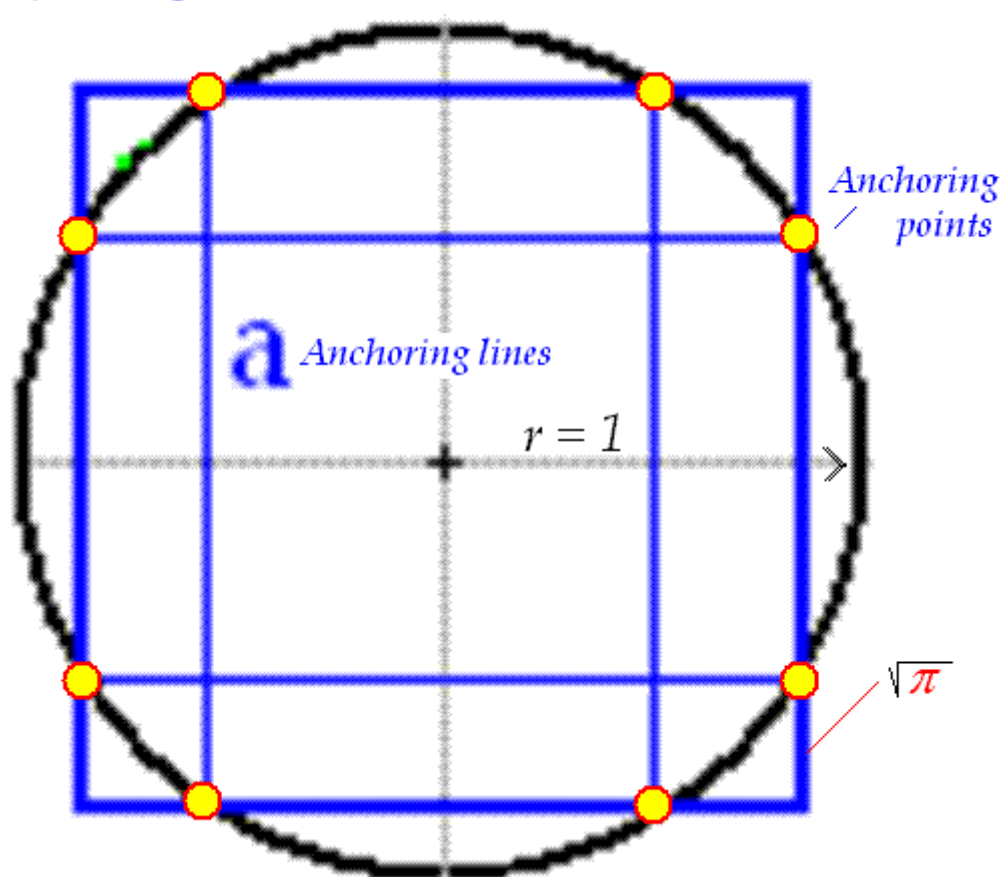


Squaring the Circle

Pattern for squaring circles

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Squaring the Circle fernando mancebo 2017 -3 -1



Drawing 1

Squaring the circle

To squaring circles we go to squaring a first circle with a practical and real procedure and later on to build a pattern that allows us squaring successive circles using simply this pattern.

Why this procedure?

Because of we must to avoid the numeric value of the Pi number to be a transcendental number.

Later, and taking advantage of this procedure, we go to produce a pattern for being used in posterior squaring.

Observation!:. Like the Greeks considered, we understand that all tools and our own measurements are ideal and accurate.

So, we proceed to make the practical construction of the first quadrature of a practical circle.

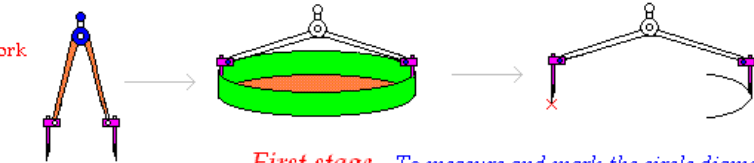
Squaring the circle ferman 2017 - 3 - 1

Object of study : **Hard circle**

"Given a circle "

Hard circumference
of very flexible material

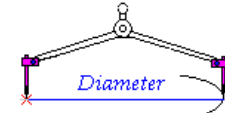
Now we going to work
on the paper



First stage To measure and mark the circle diameter

Now we
Cut to obtain the ruler

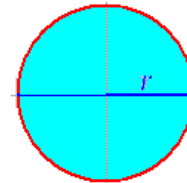
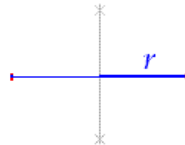
**Compass
and
Ruler**



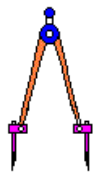
To mark the diameter line with the ruler



Find the radius
with compass



**Drawing of the
Interior circle to squaring**



**Compass
and
Ruler**

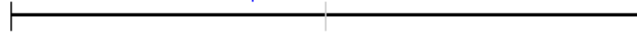
Squaring the circle ferman 2017 - 3 - 1

Second stage



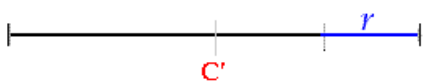
With the ruler, to mark its longitud

With the compass, to mark the center



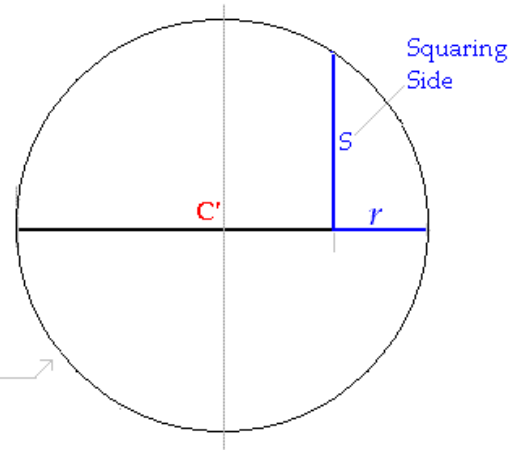
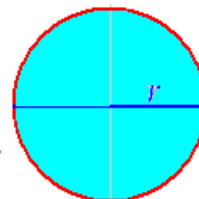
Semi-ruler + r

Find the center with the compass

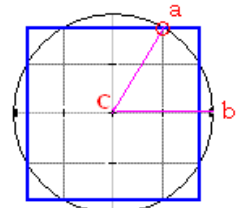
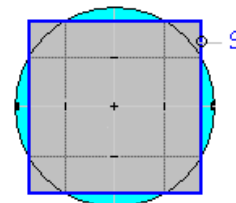


"Given circle to squaring"

Find the quadrature of this circle.



Squaring
Side



Rational Property :

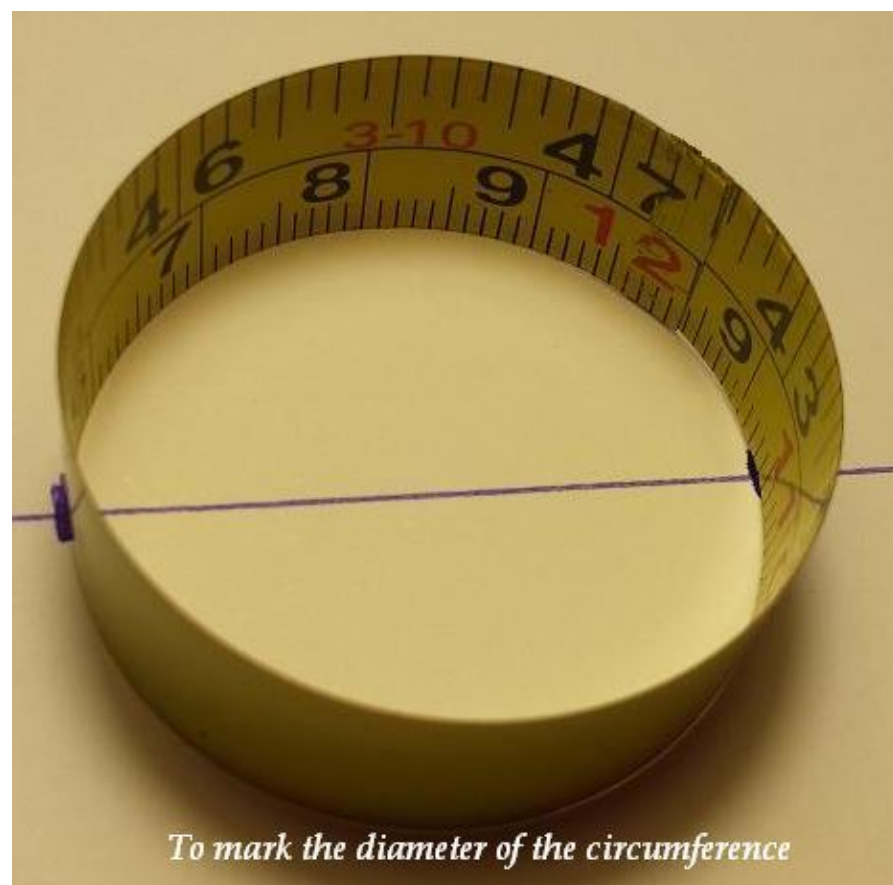
Once obtained the ruler R and the radius r we can build and squaring any circle that maintains the same ratio R/r (2π)

$$\text{Area circle} = \pi r^2$$

$$\text{Area Square} = S^2$$

Following drawings with easy representations of simple material that could be used





Construction of a pattern

And now we proceed to build a pattern of Cartesian coordinates, using for that the anterior practical solution and marking inside the pattern the relative coordinates: (radii of circles/sides of the squaring squares). Finally we mark in the pattern the straight line that delimits the longitude of sides of squaring squares in relation with the radius of the given circles.

This pattern is easy of using.

Firstly we take radius of the given circle with the compass.

Later on, we mark this radius on the radii axis of the pattern.

Then, we mark the perpendicular from the end of this marked radius.

And finally we take the longitude of this perpendicular that is the side of the square to build.

